

1. A cardboard box is 4 feet long by 3 feet wide by 1 foot high. What are the least number of square feet of cardboard needed to make one box?

$$\begin{aligned} \text{Surface area} &= 2(lw + wh + lh) \\ &= 2(4 \cdot 3 + 3 \cdot 1 + 4 \cdot 1) \\ &= 2(12 + 3 + 4) \\ &= 2(19) \\ &= 38 \end{aligned}$$

38 ft² of
cardboard are
needed

What is the volume of the box?

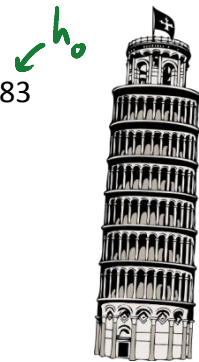
$$\begin{aligned} \text{Volume} &= lwh \\ &= (4)(3)(1) \\ &= 12 \end{aligned}$$

The volume is
12 ft³

2. You drop your camera from the top of the Leaning Tower of Pisa, which is about 183 feet high. How far will the camera be from the ground 2 seconds later?

$$\begin{aligned} h &= -16t^2 + h_0 \\ &= -16(2)^2 + 183 \\ &= -16 \cdot 4 + 183 \\ &= -64 + 183 \\ &= 119 \end{aligned}$$

The camera will be
119 ft from the
ground.



3. Suppose you want to find out how deep a well is by dropping a rock into it. If it takes 3 seconds before you hear the rock falling into water, how deep is the well? (Assume that you hear the sound instantly, so don't take into account the speed of sound.)

$$h = -16t^2 + h_0$$

$$0 = -16(3)^2 + h_0$$

$$0 = -16 \cdot 9 + h_0$$

$$0 = -144 + h_0$$

$$+144 \quad +144$$

$$h_0 = 144$$

The well is 144 ft deep.



Q: What comes once in a minute, twice in a moment, but never in a thousand years?